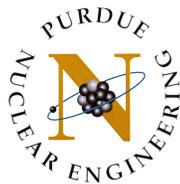


PFC Status and Directions

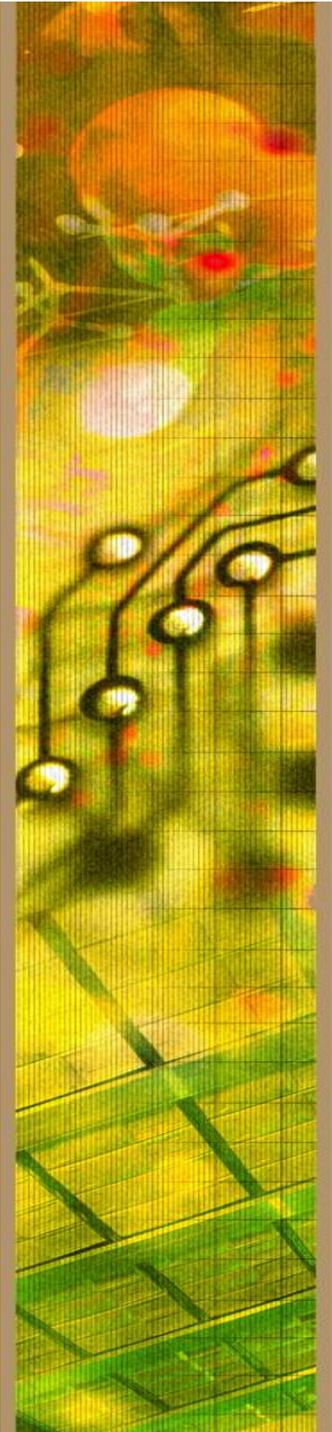
Jeffrey N. Brooks

**Plasma Facing Components Steering
Committee**

*Plasma Facing Components Annual Meeting
June 20-22, 2012
PPPL, Princeton NJ*



PURDUE
UNIVERSITY



PFC Steering Committee

Task: Guide work, priorities, budgets; facilitate communication

Jeff Brooks – Chair

Pete Pappano – DOE

Stan Milora – VLT

Members

D. Buchenauer (SNL)

R. Nygren (SNL)

R. Doerner (UCSD)

T. Rognlien (LLNL)

A. Hassanein (Purdue)

D. Ruzic (UIUC)

R. Maingi (ORNL)

G. Tynan (UCSD)

R. Majeski (PPPL)

M. Ulrickson (SNL)

A. Ying (UCLA)

C. Wong (GA)

D. Whyte (MIT)

Communication

- Working Meeting – 1/year: next – 2013 t.b.d.
- Steering Committee conference calls – monthly
- Special Topic conference calls – as needed

Programmatic issues, work areas, priorities

■ ITER/enabling-technologies (solid materials) ~90%

- Focus on *Be and high-Z* plasma facing components, plasma/material interaction, engineering, thermal issues, etc.
- Experiments at DIII-D, PISCES, CMOD, US Lab facilities (SNL, UIUC, MIT, PU, etc.)
- Modeling/analysis (plasma edge/sol, sputter erosion, ELM and other transient erosion, mixed-material response/evolution, T-codeposition, etc.)

■ Liquid lithium ~10%

- NSTX-U lithium surfaces, Lab devices/experiments, other liquid metals (Sn, Ga)

■ DEMO, Fusion Nuclear Science Facility (FNSF), other future device, PFC studies

■ JET, KSTAR, EAST, other international devices

Challenges

- Plasma facing component performance is the most critical technology issue for fusion
 - Paper P3-104, PSI-20 Conference: “*Can Tokamak PFC’s Survive a Single Event of any Plasma Instabilities?*” (A. Hassanein et al.)
 - ITER may drop carbon divertor altogether; go with tungsten even in H-phase
 - Tungsten melting, droplet formation, He ultrastructure effects-major potential limiting issues for ITER, DEMO
 - DIII-D/DiMES probe molybdenum erosion/redeposition experiment: Encouraging but much more work needed.

- PFC–work underfunded by ~X3
 - C-MOD proposed termination- major loss to US plasma/surface interaction work

- ITER full power D-T plasma in 18 (?) years–motivation issue.

US PFC Group--Challenges/Response

- Need to make the most of our funding
 - coordinate our 11 US institution's work
 - choose highest-priority work
 - aim for “critical mass” in selected areas

Wednesday	June 20, 2012	
AM	Session 1: PFC Opening Session & MASCO Continuation	Chair: J. Brooks
AM	Session 2: Joint PFC/MASCO Special Topics Session on PFC Needs for FNSF and JET ILW	Chair: D. Majeski
PM	Session 3: Tokamak Experiments	Chair: C. Wong
PM	Session 4: Plasma Edge/PMI Modeling	Chair: T. Rognlien

Thursday	June 21, 2012	
AM	Session 5: Discussion--Liquid Metal PFC Research	Chair: D. Ruzic
AM	Session 6: PMI Laboratory Experiments	Chair: D. Buchenauer
PM	Session 7: Poster Session: SBIR/STTR progress reports on funded projects & selected student research	Chair: D. Youchison
PM	Session 8: Discussion--PFC Priorities, Planning, New Directions	Chair: R. Goldston

Friday	June 22, 2012	
AM	Session 9: PFC Steering Committee Meeting Report	Chair: J. Brooks
AM	Session 10: Heat Transfer and Fluid Flow	Chair: R. Nygren
AM	Session 11: ITER Specific and Misc. Presentations	Chair: R. Doerner
AM	Session 12: PFC All-Topics Discussion & Wrap-Up	Chair: J.P. Allain